Russian Mathematics 2015 vol.59 N2, pages 67-70

Solving the problem of Bingham fluid flow in cylindrical pipeline

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Abstract

© 2015, Allerton Press, Inc. We consider an elliptic variational inequality in a circular domain, which simulates viscoplastic Bingham flow in a pipe. This variational inequality is approximated by finite-difference scheme on a grid in polar coordinates. To solve the finite-dimensional problem we propose a generalized Uzawa-type iterative method. We prove the convergence of the iterative method.

http://dx.doi.org/10.3103/S1066369X15020103

Keywords

Bingham flow, finite-difference approximation, iterative method